Formulasi Beads Kalsium Pektinat yang Mengandung Deksametason-Probiotik Tersalut Eudragit sebagai Sistem Penghantaran Kolon Tertarget = Formulation of Calcium Pectinate Beads Containing Dexamethasone-Probiotic Coated by Eudragit as Colon Targeted Delivery System

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Abstrak

Inflammatory Bowel Disease (IBD) adalah istilah untuk dua kondisi, yaitu Ulcerative Colitis (UC) dan Crohn Disease (CD) yang ditandai dengan peradangan kronis pada saluran gastrointestinal. Deksametason memiliki spesifisitas yang kurang sehingga dapat menyebabkan efek samping sistemik apabila digunakan secara jangka panjang. Pengobatan IBD memerlukan suatu sistem penghantaran kolon tertarget untuk mengurangi efek samping deksametason. Penelitian ini bertujuan untuk memperoleh formulasi beads kalsium pektinat yang mengandung deksametason (F1) dan kombinasi deksametason-probiotik (F2) serta mengetahui karakteristik dan profil pelepasannya melalui uji pelepasan in vitro. Jenis probiotik yang digunakan adalah Lactobacillus acidophilus dan Bifidobacterium longum. Beads dibuat menggunakan metode gelasi ionik dan disalut menggunakan Eudragit L100 (FA) dan Eudragit S100 (FB), sehingga didapatkan F1A, F1B, F2A, F2B. Karakterisasi dilakukan terhadap beads sebelum dan sesudah disalut. Uji pelepasan in vitro pada beads tersalut dilakukan dalam medium HCl pH 1,2 selama 2 jam, medium dapar fosfat pH 7,4 selama 3 jam, dan medium dapar fosfat pH 6,8 selama 3 jam. Beads yang dihasilkan berbentuk hampir sferis dan memiliki nilai efisiensi penjerapan yang tinggi, yaitu 82,730% ± 0,774% (F1) dan 94,414% ± 0,477% (F2). Sebagian besar beads terdistribusi pada ukuran diameter 0,841-1,190 mm. Hasil pelepasan obat kumulatif akhir pada F1A, F1B, F2A, dan F2B, berturut-turut adalah 89,919% ± 0,524%, 87,653% ± 0,713%, 98,695% ± 1,486%, dan 97,406% ± 0,459%. Berdasarkan hasil pengujian, beads kalsium pektinat tersalut mampu menahan pelepasan deksametason dalam medium asam, namun belum berhasil menarget kolon.

.....Inflammatory Bowel Disease (IBD) is a term for two conditions, namely Ulcerative Colitis (UC) and Crohn's Disease (CD) which are characterized by chronic inflammation of the gastrointestinal tract. Dexamethasone has poor specificity so that it can cause systemic side effects when used in long term. The treatment of IBD requires a colon targeted drug delivery system to reduce the side effects of dexamethasone. This study aimed to obtain a formulation of calcium pectinate beads that containing dexamethasone (F1) and combination of dexamethasone-probiotics (F2) and to determine the characteristics and release profile through in vitro release tests. The types of probiotics used were Lactobacillus acidophilus dan Bifidobacterium longum. Beads were made using the ionic gelation method and coated using Eudragit L100 (FA) and Eudragit S100 (FB), so that formulas were F1A, F1B, F2A, and F2B. Characterization was carried out on the beads before and after they were coated. In vitro release test on coated beads was carried out in HCl pH 1.2 medium for 2 hours, phosphate buffer medium pH 7.4 for 3 hours, and phosphate buffered medium pH 6.8 for 3 hours. The resulting beads were almost spherical in shape and had high entrapment efficiency values, namely 82.730% ± 0.774% (F1) and 94.414% ± 0.477% (F2). Most of the beads were distributed in diameter sizes from 0.841 to 1.190 mm. The final cumulative release results of F1A, F1B,

F2A, and F2B was 89.919% ± 0.524%, 87.653% ± 0,713%, 98.695% ± 1,486%, dan 97.406% ± 0.459%. Based on the test results, the coated calcium pectinate beads were able to resist the release of dexamethasone in acidic medium, but had not succeeded in targeting the colon.